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the climate. He directs attention especially to the water-storing tissue, which he declares to be no xerophytic character (i. e., one that serves as an adaptation to a long dry period), but to have its relation to the transpiration of plants that have only to endure short dry periods. This tissue is almost confined to leaves of tropical and subtropical regions, where by the frequent rains and by the dews, which are heavy even in the dry periods, it can daily be refilled, quite independently of the roots. This refilling HOLTERMANN claims to have established experimentally; but the report is not convincing, particularly as this process is alleged to take place through the epidermis. If water can come in so, it can go out so; and the plant would be the gainer only when the period of evaporation was shorter than the period of absorption.

The third section discusses the leaf fall in the tropics. This, HOLTERMANN holds, is dependent on internal conditions which become active under the influence of climatic factors. Leaves which fall off at the beginning of a dry period are not built to withstand drought; and even if the fall be delayed by favorable conditions, it is only delayed, abscission having become a hereditary peculiarity.

The formation of growth zones is the fourth topic. The author undertakes to show that the formation of zones in secondary wood is incited by climatic factors, acting upon an inherent capacity for differentiation, which, arising originally by direct adaptation, has become heritably fixed. Just how these external factors act, he thinks, will always remain a problem.

The last section, on direct adaptation, deals with water-storing tissue, gutter-pointed and emarginate leaves, dwarfing, etc., as "caused" by definite external conditions. Such new characters, called out at first by the release of latent powers, may become fixed and heritable, just as leaf fall and growth rings, or under other conditions may again disappear.

The book is full of interesting observations, which are unfortunately not easily accessible for lack of an index.—C. R. B.

Ecology of West Australia.—The series of monographs on plant geography[2] has received a notable addition in the seventh volume, dealing with the flora of southwestern Australia,[3] by Dr. DIELS. His thorough knowledge of the herbarium material from this and similar regions, and his wide acquaintance with plant distribution made him able to plan and execute in the most profitable way the journey which he undertook in 1900–1902, in company with Dr. PFITZER, with the support of the Humboldt fund of the Royal Prussian Academy of Sciences.

The systematic results have already appeared, in collaboration with PFITZER, in ENGLER'S *Botanische Jahrbücher*. In this volume we have first, by way of introduction, the outlines of plant distribution in the whole continent; then the history of botanical exploration in extratropical West Australia; the physical geography of this region; an ecological study of the vegetation of the southwest province, lying near the coast, and that of the Eremaea province, which fills the rest and extends far beyond the bounds of West Australia; and finally a discussion of the floristic regions, the elements of the flora, its relations to others, and its developmental history.

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[2] ENGLER, A., und DRUDE, O., Die Vegetation der Erde. Sammlung pflanzengeographische Monographien. Leipzig: Wilhelm Engelmann. 1896—.

[3] DIELS, L., Die Pflanzenwelt von West Australien sudlich des Wendekreises. Imp. 8vo. pp. xii+413. *1 map, figs. 82, pls. 34.* Leipzig: Wilhelm Engelmann. 1906. *M* 36, geb. 37.50 (subs. price *M* 24, bound 25.50).

It is quite impossible to summarize this work, or to do more than direct attention to it as a thorough and careful report of the present state of knowledge regarding this bit of that great continent. For only a beginning has been made around the edges; and only a realization of the fact that in the interior there are great stretches that probably present a nearly uniform vegetation, prevents one feeling unduly the meagerness of the present knowledge, even with this great addition.

DIELS finds that in this geologically little disturbed southwestern region there has been the quiet development of a flora quite at one originally with that in the east, though the two are now widely separated by the Eremaea province, and the eastern flora has been disturbed by competition with other elements. In the specially favorable conditions of the southwest, however, development along lines of progressive endemism has brought many genera to remarkable expansion and high differentiation. DIELS rejects as an error the idea of many authors (notably WALLACE) that the West Australian flora represents the original one, which spread east; he considers it rather as an old panaustralian one, further specialized. The Eremaea flora prevails in a climate which could not have corresponded to the conditions of the old Australian flora; it is rather a selection from the primitive flora adapted to the gradual drying and enriched from the tropical north. Finally, there has come the disturbing influence of man. Even the aborigines set fire to the "bush," and the Europeans, in the seven decades of their occupation, have wrought still greater changes.

The illustrations are numerous. Part are half-tones, from photographs by PFITZER; part are detailed drawings, after the style of the *Pflanzenfamilien*, of the characteristic species. A topical index and one to plant names (not as convenient as a single one) makes the matter readily available.—C. R. B.

Plant geography

In spite of our tardiness in reviewing it, we cannot forbear calling attention to the brief discussion of certain central topics of plant geography by Count SOLMS-LAUBACH.[4] The book has grown out of lectures, given twice in the course

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[4] SOLMS-LAUBACH, H. GRAF ZU, Die leitende Gesichtspunkt einer allgemeinen Pflanzengeographie in kurzer Darstellung. 8vo. pp. x+243. Leipzig: Arthur Felix. 1905. *M* 8.

This work was received at the close of 1905 and was sent at once to a competent reviewer, but was overlooked and recently returned at the editors' request.